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ATALEKTASIS PULMONUM;

OR,

Closure of the Air-Cells of the Lungs in Children

BY

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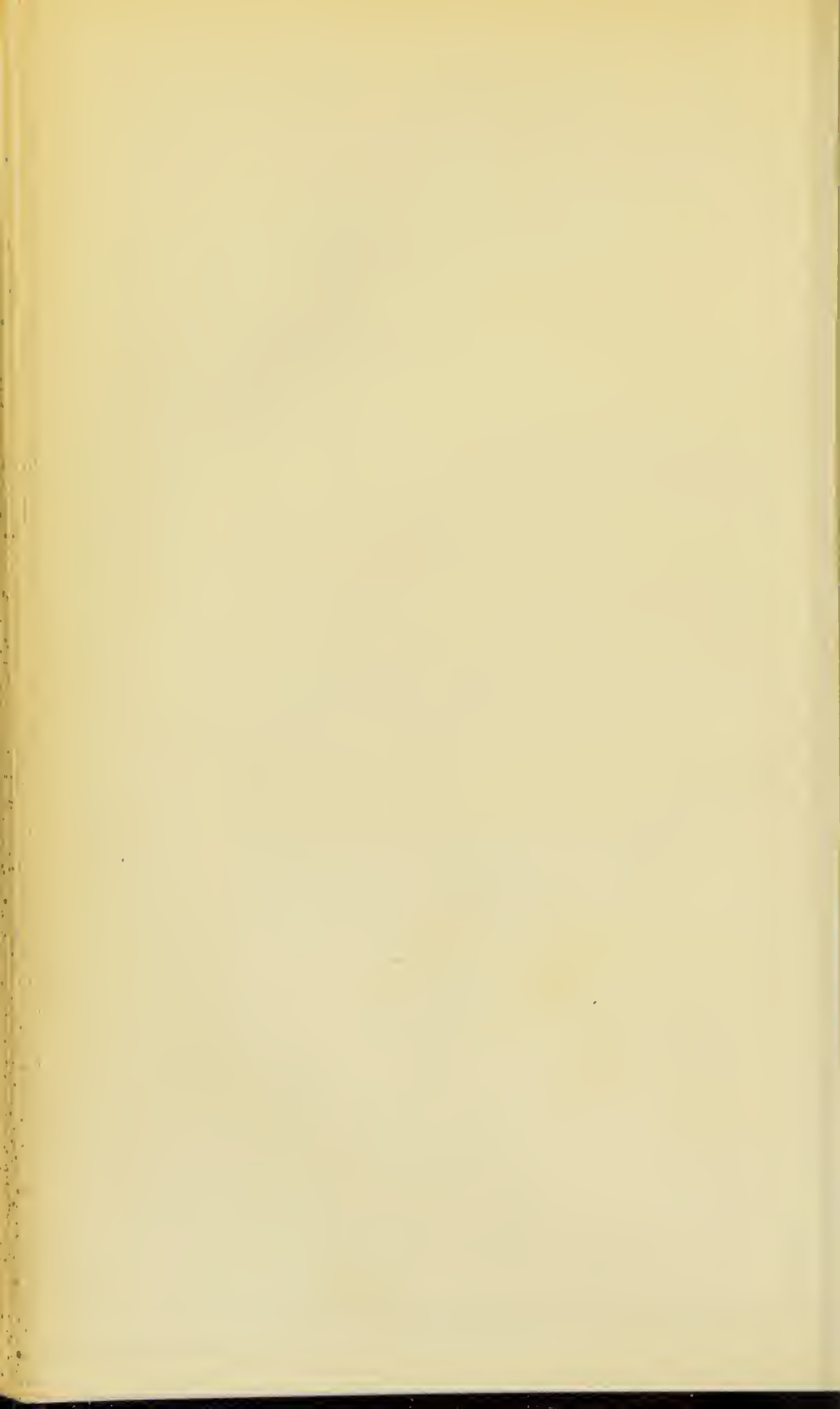
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MANY of the observations contained in the following pages have appeared, at different times, in the medical periodicals; the little attention the subject has received from the profession must plead an apology for their republication in the present form.

Cases of atalektasis are so frequently met with, and so universally misunderstood, that the attempt briefly to describe them scarcely requires an excuse, and while the writer is fully aware how imperfect the outline here projected for abler hands to fill up, still,—if the main features of the affection are correctly drawn,—it will not be difficult to complete the delineation.

*2, Artillery Place, Finsbury Square,
April 17, 1850.*



ATALEKTASIS PULMONUM.

SYNONYMES. Atalektasis, from *ατελης*, imperfect, *εκτασις*, expansion,—carnification (unconnected with effusion).—Etat foetal.

Atalektasis, the term which I have selected of the above, is intended to designate a condition of lung in which there is simple occlusion or shutting up of the pulmonary air-cells, without any inflammatory or other morbid deposit, a condition exactly similar to that of the organ during intra-uterine life, or that to which it may be reduced after birth, from the compression of surrounding fluid, as in pleurisy.

The affection is met with under two forms.

I. ATALEKTASIS, EXISTING AS A DEFECT FROM THE HOUR OF BIRTH.

II. ATALEKTASIS, OCCURRING AS A DISEASE AFTER BIRTH.

Examples of the first form were first published by Professor Joerg, of Berlin; and a translation of his remarks appeared in Dr. Stokes' admirable work on Diagnosis of the Diseases of the Chest.

Cases of the second form were first noticed by myself, as early as December, 1838, in a paper appearing in the Medical Gazette, for January, 1839, have since been mentioned by Messrs. Barthez and Rilliet, in their treatise "*Des Maladies des Enfants*," and more lately described by Messrs. Bailly and Legendre.*

Having thus recognised the two forms of atalektasis, I think, as many of the symptoms are common to both, and the state of lung nearly identical, it will avoid useless repetition, if they are described together.

SYMPTOMS.

I. ALTERED MOVEMENT OF THE RIBS IN

* Archives Générales de Médecine.

RESPIRATION, is *the* pathognomonic symptom ; and I believe sufficiently characteristic to enable the observer, in most instances, to recognise at once the nature of the case. I hope the following cursory explanation will explain and account for its occurrence.

In the infant still-born, but slowly recovering from the state of asphyxia, the first symptom of animation consists in a sudden and abrupt contraction of the diaphragm constituting the primary effort at inspiration. The expansion of the lung at that moment, is not in exact relation with the descent of the muscle, nor is extra uterine life fully established, for pulsation continues in the funis, and does not cease until respiration is more perfect ; there is a larger or smaller portion of lungs still in a foetal condition, in fact, in a state of atalektasis.

Owing to the organs being still partially solid, a very singular circumstance will be

noticed, if the thorax of the infant be observed :—during the inspiratory effort, the ribs move inwards or backwards, towards the mesial line of the trunk, instead of outwards as in ordinary respiration, diminishing instead of increasing the transverse diameter of this cavity. As this is the result of unexpanded lung, if respiration become properly established, the lungs being fully expanded, it disappears, sometimes after one or two inspirations ; but if the lung remain closed it will perpetuate the altered movement, and it then becomes the symptom of atelektasis.

It is not difficult to account for this phenomenon. When the diaphragm descends, unless the lung expand at the same time, a vacuum would result if the thoracic walls remained immoveable, or enlarged as in healthy respiration ; but the parietes being flexible, especially at this early period of life, yield to the external

atmospheric pressure, pass inwards instead of outwards, and the capacity of the cavity continues in relation with the imperfectly expanded lung.

Bearing this in mind, it will be natural to suppose that the same condition of lung supervening as a post natal disease, especially if occurring while the ribs have as yet the flexibility natural to them, during childhood, will be accompanied with the same altered movement, and this will be found to be the case ; it therefore becomes the characteristic symptom. It may indeed be present in one other class of cases ; but then other concomitant symptoms will enable the practitioner to distinguish them ; I mean where obstruction of the primary air-tubes prevents a free ingress of air to the lungs, as in croup, and laryngitis ; it is a symptom, although hitherto almost entirely neglected, of these diseases ; but there will be no difficulty with the stridulous, or laryngeal breathing

present, to distinguish between these cases and the affection of which we treat. At the same time it will at once render the diagnosis easy between atalektasis and pleurisy, pneumonia, or phthisis, in neither of which diseases, unless associated with the former, do the ribs ever pass inwards.

II. LARYNGISMUS STRIDULUS, in infants the subjects of atalektasis from birth, is a very common symptom, and many are carried off by a sudden spasmodic attack. The imperfect expansion of the lung renders necessary an exact equilibrium between the inspiratory and expiratory effort, and any sudden exertion destroying such balance is followed by closure of the glottis. I am not aware of any modification of this affection as a symptom in these cases; the crowing comes on suddenly when the infant is quickly moved or excited, and is generally present at the moment of awaking from sleep. Where the affection comes on after birth I have not observed this symptom.

III. COUGH. As the last described symptom is peculiar to atalektasis of the first form, so this is observable only, or chiefly, in cases of the second form, and then it becomes very significant. The mother will often trace the commencement of the attack to a troublesome dry cough, and it is a peculiarly dry, distressing cough—a barking cough perhaps best describes the kind; it continues at times for hours, while at other times considerable intervals may elapse between the attacks; and there is little or no expectoration. It is generally, almost always, worse at night, and though reiterated, wants the spasmodic character of whooping cough.

IV. DYSPNŒA. The degree of dyspnœa present will vary according to the larger or smaller portion of the lungs solidified, but where it is at all marked there will be noticed in it a peculiarity very characteristic, and which I fancy is not met with so decidedly in other cases. The diffi-

culty in respiration seems to show itself first in the rapidity, and secondly in the unequal lengths of the inspiratory and expiratory effort, the former being much the longer : moreover, owing to the persistance of the difficulty, it becomes habitual to the child, so that you find it cheerful and taking notice when the quickness of breathing is to the observer really distressing, and would be taken by any one unacquainted with the nature of the case to denote active inflammation ; this constitutes the peculiarity to which I allude.

V. EMACIATION. This, as a symptom in infants suffering from birth, has been mentioned by Professor Joerg, and may proceed in them to the extreme of marasmus. The case of the infant E. R.* is an instance of this, and I know not that I ever opened a more attenuated body. Where the disease comes on afterwards, I have never seen the emaciation proceed to such an extent.

* See Case IV.

In the latter cases it is confined chiefly to the limbs, the abdomen at the same time becoming unduly tumid, for the abdominal muscles, by the altered movement of the ribs already spoken of, lose to a great degree their power of compressing the viscera, their fixed point of action is removed, and hence the intestines, especially the colon, become distended with air, and, together with venous congestion, to be described hereafter, increase the bulk of the containing cavity.*

VI. PALPITATION. Increased action of the heart is not met with in the first form of atalektasis, as far as I have seen, except where the foramen ovale continues open; in the second form, where the disease has continued some time, it is very marked both in frequency and force, giving all the indications of enlargement of that organ. Sometimes hæmorrhage from the nose, and

* This symptom was first pointed out in these cases by Dr. Snow.

more rarely from the rectum, seems to afford temporary relief to this symptom.

VII. CYANOPS seems to have been present in many of the cases described by Professor Joerg, and as far as my memory serves me, in every case I have opened where the cœrulean tint was marked, and the foramen ovale open, a larger or smaller portion of the lung has been solid, though at times apparently more from congestion and hepatisation than atalektasis; at other times the degree of venous congestion, owing to the impediment offered to the return of blood from the systemic circulation, by the altered movement of the ribs, and the imperfect oxygenation consequent upon the decreased aerating surface in the lungs, gives a dusky hue to the skin, especially of the extremities, that is not unlikely to be mistaken for morbus cœruleus.

VIII. DEFORMITY OF THE CHEST. Finally, we have in both forms of the affection, if the atalektasis be considerable, and life con-

tinue sufficiently long, deformity of the chest resulting as a means of adapting containing to contained parts. The direction of the deformity will depend upon the original constitution of the subject. If a strumous diathesis be present, strumous, or ricketty malformation of the chest will result. The bones themselves will yield beneath the arms, where a hollow will occur, narrowing the cavity in that direction, while the front projects unnaturally forwards. The common form of ricketty chest is, I believe, usually the consequence of atalektasis of the lung, and this explains a difference not otherwise readily accounted for, namely, why in one case, with considerable ricketty deformity of the extremities, there is a fully expanded and well-formed chest, while in another, with the limbs straight, the altered shape of the chest is so considerable ; it is because in the latter case the lungs have previously become shrunken. Owing to a vitiated

atmosphere or other depressing cause, atalektasis of the lungs has taken place, and the walls of the chest are forced inwards to adapt them to the state of the respiratory organs. This explains the statement of Mr. Edwards—a statement confirmed in the evidence given by Mr. Ward before the House of Commons—that it is in dark and ill ventilated abodes that deformed children are most frequently met with. In my own practice the same holds true, and I have more than once met with children, born of apparently healthy and well formed parents, suffering from great rickety deformity of the chest, produced, as I believe, solely by the unhealthy situation in which they were brought up inducing atalektasis.

Popular tradition has recognized this change of shape in the chest, which it has attributed to bad nursing, holding the infant under the arms, and other extraneous circumstances, which would exert no more

influence while the lung underneath remained full of air, than they could on a cushion filled with that elastic fluid.

But this occurs only in children of a strumous habit; where no such predisposition is present, nature accommodates the parietes of the thorax to the diminished lung in a different and very peculiar manner. The point of contraction then takes place at a little distance on either side of the sternum at the line of junction between the ribs and their cartilages, a groove more or less deep developing itself there, which produces a channelled appearance on either side of the chest. At the same time, to accommodate surrounding textures, the spine becomes curved forwards by a partial dislocation of one of the lower dorsal vertebræ, thus adjusting the trunk to the diminished capacity of the thorax. When viewing the depth of the groove existing in some cases at the costo-cartilage articulation, and the consequent

ridge on the internal surface met with after death, where an extra deposition of the uniting textures applies the articulating surfaces, it will cause surprise that this deformity was so long unnoticed.

DIAGNOSIS.

From the assemblage of symptoms recounted above, there can be little difficulty in recognising the affection, though the cases have been hitherto entirely overlooked, the patients being thought to labour under chronic bronchitis or phthisis. The only circumstances under which a mistake can arise is where the altered movement of the ribs is the result of obstruction of the primary air passages; but the history of the case, with the laryngeal or tracheal breathing present, must readily, to any careful observer, distinguish the cases. Dr. Sibson is the only writer who has confirmed my statement, that this altered movement is a symptom of croup in the earlier stages,

yet the symptom is of no mean value as showing when tracheotomy may be performed with probability of success. While the lungs are free this movement will be very apparent, and the operation may relieve, but where effusion into the pulmonary tissues, either into the minute bronchi from bronchitis or pneumonia; or into the parenchyma, in the form *œdema*, has taken place, the ribs become more or less immoveable, and the incision will only hasten the fatal termination.

In both forms of the affection the previous history will assist the diagnosis. In my own practice certainly half of the cases of the first form have been twins, and universally have been born in a state of asphyxia more or less complete. As before stated, wherever a still-born babe recovers from this state, the altered movement is apparent during the first inspiratory efforts, and disappears as the lung becomes fully expanded. It becomes permanent where this

necessary metamorphosis, if the term may be employed, of extra uterine life is only partially effected.

In tracing the history of the second form of atalektasis, its origin may often be found in a severe attack of bronchitis, which has never left the child, but being succeeded by troublesome cough, slow emaciation and altered movement of the chest; or it may succeed pneumonia; and I am sure any practitioner who has had an extensive experience in the diseases of childhood will call to mind cases where, the first symptoms having been very active, the physical signs distinct, and in which treatment seems to have arrested the rapid progress of inflammation, nevertheless, at a certain point of the case, the favourable progress has been arrested, and has been succeeded by a slow and progressive emaciation, which has gone on to a fatal termination, and yet without any distinct symptoms of true phthisis pulmonalis developing themselves.

Many of these cases, on careful examination, will prove to be instances of atalektasis, and be found to present the true characteristics of this affection. In other cases the disease has seemed to be produced by change from an airy into a closer situation; it seems, indeed, emphatically the disease of malaria, and the greater number of cases I have met with have appeared to be the consequence of a vitiated atmosphere.

PROGNOSIS.

With regard to the first form, the prognosis must often be unfavourable, especially if much emaciation be present. Professor Joerg gives three terminations to this affection—recovery, secondary affections, and death. I think this may, as a general rule, be reduced to two, for where the secondary affections are present, a fatal termination almost constantly ensues. One of the secondary affections mentioned by

the Professor I believe to be a cause, not a consequence, of atalektasis, namely, the foramen ovale continuing open.

In the second form of atalektasis the case is often remedial if immediate attention can be paid to the directions of the medical attendant; but if apathy on the part of the parent, or poverty, oppose "her unconquerable bar," the remedial measures will prove futile. When the patient survives the first two years, the ribs gradually become more rigid, and the relation of the frame to the diminished volume of the breathing lung becomes adjusted; the child may after this grow and thrive, the deformed chest (constituting a variety of pigeon chest) being the only evidence of former mischief, in such cases a portion of the lung still continuing condensed. It must nevertheless be remembered that the disease may go on after this age, that it is not restricted even to childhood, but may be met with in adult life.

POST MORTEM APPEARANCES.

In the first form of atalektasis the emaciated condition of the child and the state of the lungs are the points for consideration. The emaciation may proceed to extreme marasmus. One twin I examined, who died of this affection, was, I think, as much reduced as any I have met with. The portions of the lungs most frequently found affected are the lower lobes and the middle lobe of the right lung, especially the tongue-like process, but I opened one case where the whole of the upper lobe of one lung was affected, the rest of these organs being healthy. The affected portion may be limited to a small extent, and I have often, in opening the bodies of infants, found minute portions of the thin edges of the lungs in an atalektatic condition, where I apprehend the symptoms during life have not shown themselves, owing to the small

portion of the lung which is in a solid state.

On examination, the lung affected is found solid, containing no air, and therefore not crepitating on pressure.

It is at the same time flabby, and of a dark purple colour, resembling lung submitted to pressure from effusion; in other words, carnified.

It is compact, and on incision the various tissues entering into its composition are very visible.

It is of greater specific gravity than water, sinking readily in that fluid.

But the most curious fact, first noticed by P. Joerg, and since much insisted on by Messrs. Bailly and Legendre,* is that by inflation the tissue can be made to a great degree to resume its natural healthy appearance. This fact becomes

* In mentioning the anatomical characters of the affected lung, I have partly availed myself of the description of these gentlemen.

important as a means of distinguishing between atalektasis and hepatization. In the former state the tissue is only closed, the lung is shrunken as when it is compressed by effusion, and being thus, and moreover not bound by false membrane as in pleurisy, air may be again caused to permeate the air cells, and the tissue become inflated. In hepatization the solidification is the result of interstitial deposit, and no such method can be adopted with success.

Where a post mortem is made in the second form of atalektasis, the secondary effects will be very apparent; the deformed chest and tumid abdomen at once arrest attention, and on opening the chest the chief, it may be the only object visible, is the pericardium containing a much enlarged heart pushing aside the shrunken lungs, and concealing them from view. On opening this membrane the hypertrophy is observed chiefly confined to the right cavities;

the obstruction to the pulmonary circulation causing an increase of the muscular walls on this side, the parietes of the right ventricle descend to a level with the left, and this gives the appearance of a double apexed heart.

But the obstruction is followed by more remote effects. The large venous trunks of the systemic circulation are generally found gorged with blood, and the same state is observed in their tributary streams. The cerebral veins and sinuses are distended, and the bloody points on the brain numerous where no cerebral symptoms have supervened during life. The abdominal viscera present an analagous appearance, the *venæ cavæ hepaticæ* pour forth a quantity of blood on the first incision, the liver is large and of a dark colour, the spleen sometimes much enlarged, and I have seen the kidneys much darker than natural from venous congestion.

The lungs themselves are sometimes re-

markably shrunken, the parts most frequently solidified being the lower lobes, the upper crepitating freely, and bulging over the solid tissue, that is, the surface of the healthy lung being above the level of that affected. It is a curious fact, that in only one instance, and that owing to surrounding congestion, perhaps a doubtful one, have I met with tubercles. In well marked cases of atalektasis no tubercular deposit was observable, either in the chest or abdomen.

TREATMENT.

The treatment must be considered separately as regards the two forms.

Treatment of the first form will, I believe, often prove available at the hour of birth, and I think much may be done to assist in the establishment of normal respiration, in other words, the expansion of the lung. The great point will be, to wait some time before dividing the funis, if there

be, as there generally is, a continuance of pulsation; by this means an equalization of the systemic and pulmonary circulations will be encouraged, the blood, as yet extraneous to these systems, being returned to the placenta. At the same time, the usual excitants to respiration will prove beneficial, such as exposing the surface of the body, alternating pressure on the chest and abdomen, tickling of the feet, &c. After an interval of two or three minutes, the cord may be divided without tying, and some blood allowed to escape. I think this the most efficacious means in our power, and I feel assured I have seen it succeed in enabling the infant to breathe more freely, the lung to become inflated, and in consequence the altered movement to disappear. The warm bath will be a powerful adjunct to the means just recorded.

Where all endeavours fail, and the lung remains still unexpanded, the after treat-

ment will consist in keeping the infant in an equable temperature, for a remarkable proneness to bronchial inflammation always exists, and any affections of the respiratory organs will tell with double violence upon a subject where the aerating surface is already diminished.

Treatment of the second form. This will consist very much in hygienic measures. Close and unhealthy situations seem to be the great predisposing causes to atalektasis, and a removal from such habitations will be the first grand desideratum. Many of these children are offspring of the poor, and live in down-stairs or underground apartments, or it may be are brought up in a little back shop parlour, some of which in this great metropolis are certainly the most miserable of dwellings; and unless a removal from such localities can be effected, I think all medical aid will be in vain. It may be possible to avert the difficulty by a slight change to a neigh-

bouring larger street, or to the upper part of the house, but where possible, complete change of air to a more salubrious and warmer spot should be enjoined. The next point to be imperatively insisted on is to keep the patient always in a recumbent position, and this should be on a firm unyielding surface, a pillow spread on a board, or a small matrass being the best couch. It will require much firmness on the part of the medical attendant to secure this, but I believe the importance of the measure will justify the insisting upon it. The position seems to antagonize, to the small extent we are able, the altered movement, and by keeping the spine supported and extended, renders more tardy the projection of the column, so giving the best chance for the condensed lung again to expand.

To further this object a dry diet will prove useful, so as to diminish the quantity as far as possible of the circulating

fluid, and avoid unnecessary abdominal distension. The diet must not be poor; for a child of two years old a portion of meat once a day, with bread, and no vegetables, should constitute the chief meal, and a half tea-cup full of weak tea or coffee should be all the fluid taken at tea and breakfast. Fruit and pastry to be strictly prohibited. Where the abdomen is very tumid, the cause being the weakened influence of the abdominal muscles, a bandage, elastic and not too tight, may be applied.

Internal treatment should be administered with a regard to the secondary affections rather than with the idea of influencing the state of the lung itself. This treatment may be comprehended in few words. To secure a free action from the skin and kidneys, to relieve the ever-recurring congestion of the hepatic vessels, and as far as possible combine these with the administration of a tonic.

No medicines prove in my hands so efficacious to secure the first endeavour, namely the action of the skin and kidneys, as small doses of ipecacuanha and nitre combined with hyoscyamus; these I generally order with a small proportion of the sulphate of magnesia, constipation being always present, as in the following mixture.

Potass nit	.	.	℥
Vin Ipecac	.	.	3 i
Magnes sulph	.	.	3 ii
Syr croci	.	.	3 i
Aquæ anethi	.	.	3 iijs ℥.

Of this three tea spoonsful three times a day may be given to a child of two years old. To relieve the liver a very small dose of some mild mercurial may be administered once or twice a week, and as the smallest dose required is the best, I think it may be combined with a small portion of aloes to advantage, as in the following powder.

R Hyd. c. cret. gr. iss.

Pulv. aloes, gr. iij. m ft. pulv. pro re natâ.
sumend.

Where mercury seems out of the question, the compound decoction of aloes is a valuable remedy, and certainly exerts an influence on the hepatic system. In these, as in all cases of habitual constipation in children, a purgation must be secured after the use of the mineral, or the smallest dose may be succeeded by cancrum oris.

The action of the skin must be promoted by warm clothing; flannel should always be worn, and the arms and legs carefully covered.

The subject of atalektasis in the adult is one full of interest; that it does occur we are assured by Dr. Baly, an observer not likely to be mistaken, who has mentioned instances where he met with portions of the

lung in this condition.* I feel convinced that some cases of asthma in its most distressing form will be found to be associated with and caused by this affection of the lungs. I have cases at present under my care, where the distressing symptoms induce me to think atalektasis is present, but as I have had no opportunity of verifying my conjecture, I wait till post mortem examinations enable me to speak with confidence on the point.

* See Dr. West's admirable Lectures.

CASES.

CASE I.—Mrs. B.'s infant appeared still-born. After a lapse of ten or twelve minutes, the usual restoratives having been employed, the first symptom of animation was perceptible. This consisted of a sudden inspiratory effort; the chest was uncovered at the time, and it was observed that the lower ribs at the same moment, instead of moving upwards and outwards, as in ordinary respiration, were drawn, or rather pressed inwards and backwards towards the mesial line, giving a peculiar constricted appearance for the instant to the base of the thorax. After a short interval, another inspiration succeeded fuller and freer than the first, the abnormal movement of the ribs being less visible. After a third and fourth inspiration the child cried, the lung became fully expanded, and the ribs assumed the proper movement.

This is a simple example of recovery from asphyxia, presenting that altered movement of the ribs always present in such instances, until recovery is complete.

CASE II.—J. G., aged eleven months, was brought to me labouring apparently under severe inflammation of the lungs, as indicated by great difficulty of breathing, acceleration of the circulation, the pulse being 122, short dry cough, dilated *alæ nasi*, &c., while the physical signs were to a great degree absent, only mucous râles being here and there perceptible.

The patient was much emaciated, the abdomen tumid, the chest deformed, the deep groove being apparent where the ribs united with the cartilages, and the altered movement very apparent.

Post mortem. — The thorax being opened by cutting through the ribs, a projection inwards along the costo-cartilage articulation corresponded with the depression externally.

The central lobe of the right lung, and a great part of the lower lobe of the left, presented a dense firm texture of a dark purple colour, resembling most nearly a lung compressed from effusion; a portion cut off sank immediately in water. There was also injection of the bronchi, but slight in degree. The pleuræ were healthy; there were no tubercles.

The abdominal viscera presented no morbid appearance.

CASE III.—E. R., aged two months, living in Orange Street, Bethnal Green, was brought to the General Dispensary for Children, with symptoms of the last stage of pneumonia; great dyspnœa, lividity

of countenance, cold extremities, and other evidences of collapse being present. The state of the infant forbade any careful examination, but I detected some crepitation over the lower lobes of the lungs, there was also the altered movement of the ribs in a marked degree.

The mother stated the infant cried very feebly when first born, had been very delicate and weakly since birth, and always suffered from cough and shortness of breath, accompanied by drawing in of the chest. The infant died shortly after I had seen it.

Post mortem, forty-eight hours after death. Body diminutive, much emaciated; sternum and costal cartilages very prominent. On opening the thorax, the lungs appear shrunken, imperfectly filling the cavity. These organs are of a bright, florid, red colour on their upper surface. On the superior lobe of the left lung is a large sub-pleural emphysema of the size of a pigeon's egg. There is also interlobular emphysema apparent over the upper lobes of both lungs. The emphysematous points looking like glass beads scattered over the lungs. The lower lobes of both these organs of a dark purple colour, and almost entirely solid. Some portions having the exact appearance of being carnified from compression, with less flaccidity; on tracing the bronchi into the lower lobe of the left lung, some dilatation of the larger tubes was apparent, but no obstruction nor obliteration of the lesser tubes could be detected.

Abdomen. With the exception of simple enlarge-

ment of the mesenteric glands, the abdominal viscera were healthy.

CASE IV.—E. R., ætat five months, 20, Francis Street, Hoxton, one of twins, the other having died two months since, was brought to me in a state of extreme marasmus and exhaustion, with cough, and very decided altered movement of the ribs. She had been born in a state of asphyxia; has also suffered from larynginus stridulus, and gradually pined away from the hour of birth, being affected with shortness of breath and cough. Her state rendered the admission of stimulants the only admissible treatment, and she died a few days after I first saw her.

Post mortem, twenty hours after death. Body extremely emaciated, no trace of adipose tissue remaining apparent.

Thorax. Trachea, and bronchi healthy; lower lobes of both lungs solid and purple, in a state of atelectasis; heart and pericardium healthy, the heart small.

Abdomen. Stomach healthy, as well as spleen and pancreas, the liver of ordinary size, but of a very dark colour, the hepatic veins congested; gall bladder partially filled. The remaining organs healthy, the blood throughout of a very watery character, without coagulation.

Head. Meninges healthy; brain pale and soft, some serous fluid externally.

CASE V.—James K——, aged three years, residing in Grocers' Hall Court, when first seen by me was in a dying state; suffering from great difficulty of breathing, quick and irregular pulse, livid countenance, swollen and cold extremities, and other signs of a moribund condition. On examination, the chest was found much deformed, the ribs bending in near the junction with their cartilages, as in ordinary strumous deformity of the chest. There was also the altered movement of the ribs, but less considerable than in the former cases. The abdomen was much enlarged: there was evidently ascites; and on slight pressure, a very greatly enlarged spleen could be felt, occupying the left half of the cavity.

The mother stated that the child had been ill eight months; that previous to that time he had been healthy, able to walk about, and that no deformity of the chest was apparent; that his illness commenced with a violent cough; that his breath had been short since, and the chest had become more and more contracted: among other symptoms she mentioned epistaxis, to which he had been liable at intervals to a considerable extent, the blood running from the nostril in a stream. It is about ten months since he was removed from a more healthy situation to the close neighbourhood of Grocers' Hall Court.

Post mortem examination, twelve hours after death.—Ricketty deformity of the chest, emaciation; abdomen much enlarged.

Thorax. On opening the thorax, the pericardium, containing a greatly enlarged heart, the most prominent object, owing to the hypertrophy of which organ, and the narrowing of the chest, only a small portion of lung was visible; the veins of the neck, the *venæ jugulares*, and *venæ innominatæ*, turgid with blood; the right cavities of the heart also much distended, these cavities being greatly dilated; the valves of the heart healthy; the lungs shrunken to half their size; of a purple colour, with here and there ecchymosed patches of a brighter hue; these organs, to the feel, flaccid, imperfectly crepitating, some portions quite solid, and accurately resembling lung carnified by the compression of effusion into the pleura.

Abdomen. Ascites; the liver much enlarged, of a dark colour; on incision, the *venæ cavæ hepaticæ* found gorged with blood; the gall-bladder full; the spleen very much augmented in volume, being half the size of the liver, the enlargement apparently dependent upon venous congestion; the pancreas healthy; the mesenteric glands enlarged; the intestines healthy, with the exception of enlargement of Peyer's glands; kidneys much congested; spots of ecchymosis apparent under the fibrous tissue; the calyces and infundibula occupied by a substance of a purple colour, apparently firmly coagulated blood; head not examined.

CASE VI.—Elizabeth L——, living in a back

room, ground-floor, Long Alley, aged ten months, brought to the dispensary for shortness of breath and cough, presenting the same set of symptoms as already described, without the same degree of collapse, the cough, of a peculiar character, being short, and at times reiterated as in pertussis; the dyspnœa considerable, and the altered movement of the ribs very remarkable. On examination of the chest the ear detects loose bronchial râle here and there, and over the lower lobes of the left lung small crepitation. The abdomen tumid; bowels confined; tongue coated.

The mother's account is as follows:—the infant was a seven months' child; apparently still-born, but recovered gradually. It has been subject since birth to shortness of breath; the mother always observed the altered movement of the ribs, and when she took it to the Hospital, pointed out the circumstance. It came to live at Long Alley six months since, and from that period has gradually declined. About six weeks since, it suddenly became feverish and more oppressed in its breathing, and the cough then first commenced, being peculiarly harsh, and "causing a blue vein to rise up in the neck."

The treatment in this case, which was very simple, seemed at first to relieve, and the patient revived for a few days; but the improvement was of short duration—the dyspnœa and cough prevented the infant's rest, and it sank gradually from exhaustion, after it had been attended about three weeks.

Post mortem examination, twelve hours after death.—The body emaciated; abdomen tumid; lower extremities ricketty.

Thorax. On opening the chest, the lungs observed somewhat small, and a large portion of those organs solidified, the solid portions being of a dark purple colour, and soft, flaccid feel; in fact, exactly similar to carnified lung, this carnification extending over a considerable part of the upper and lower lobes of both lungs, especially along the thin marginal edge of the lobes and the middle lobe of the right lung. On inserting a blow-pipe into the right bronchus, and inflating the corresponding lung through it, the organ becomes pervious to air throughout nearly the whole of its extent, a great portion, previously solid, becoming inflated, losing its purple tinge, and assuming its healthy appearance. The pericardium healthy. The heart of average size; small digitations on tricuspid valves; the remaining valves healthy.

Abdomen. The liver healthy, but large; the venæ cavæ hepaticæ turgid; the gall-bladder full; pancreas and spleen natural; the stomach and intestines much distended with flatus; mesenteric glands hypertrophied; the stomach and intestines perfectly healthy.

Head. Bones widely separated, only very partially ossified; the sinuses full; on removing the calvarium some effusion observable beneath arachnoid covering hemispheres; brain soft, numerous bloody

points on centrum ovale ; the remainder of the organ healthy.

CASE VII.—G. Poole, ætat one year and eight months, brought under notice labouring apparently under pneumonia of a severe form ; dyspnœa very intense, constant restlessness, short cough, and much feverish excitement. The extreme restlessness rendered it impossible to auscult the patient, but on undressing him the altered movement of the ribs was very marked, and the respiratory efforts evidently produced much suffering. The treatment was directed with a regard to the inflammatory symptoms present, but failed to relieve, and the patient sunk forty-eight hours after I first saw him, having only presented the severe symptoms a week before his death.

Post mortem.—Body emaciated ; chest flattened at sides.

Thorax : false membrane, to a small extent, over the lower lobes of both lungs, very slight and peculiarly dry to the touch. The lungs themselves in this situation of a dark colour, and almost entirely solid. On inflation through bronchi the shrunk and solidified tissue resumes its pristine volume and healthy appearance. Trachea healthy ; bronchi containing only a small quantity of mucus. Pericardium healthy ; heart enlarged ; right cavities gorged with blood ; valves healthy.

Abdomen : ascending and transverse colour, much

distended with flatus; kidneys large and congested. The remaining viscera healthy.

This is the only case where I have seen atelectasis combined with any inflammatory appearance of the pleuræ, and the child's sufferings were most intense. That there had been no liquid effusion in this case I feel convinced, from the short time active symptoms had been present, the mobility of the chest in respiration, and especially from the peculiar dryness of the false membrane visible; it struck me the pleuritic inflammation had been excited by the reversed action of the ribs increasing the friction between the costal and pulmonary pleuræ; at any rate, I feel certain that the great suffering of the patient could be so explained. Simple pleurisy being denoted in the child by a perfectly motionless state of the thoracic walls in breathing.

CASE VIII.—Emily Jones, ætat ten months, living at Mark Street, was brought in a state of exhaustion and emaciation, with distressing cough and shortness of breath, the altered movement of the ribs I think more marked than I have ever seen it, and the deformity of the chest considerable. The woman who brought it stated that it was a beautiful babe when first born, and continued to thrive until the end of two months, when it was put out to nurse with a miserably poor old woman, occupying a single close room, and from that time she dated the commencement of the present ill-

ness, which began with a severe cold and cough.

On examination I found that besides the disease of the lung there were evidences of syphilitic cachexia, denoted by some snuffling and small condylomatous sores on the nates. A genial atmosphere, change of abode, and proper clothing and food, caused a degree of revival in this infant most extraordinary, and had not severely cold weather set in, the case had every appearance of progressing favourably; a few hours of frost and easterly wind, however, seemed to decide the issue. The countenance became livid as well as the extremities; the breathing more oppressed, and the infant died within forty-eight hours of the change of weather.

Post-mortem, twelve {hours after death.—Body emaciated, having two or three syphilitic spots on nates and thighs.

Thorax: The deformity very apparent, consisting chiefly in a depression at the line of union between the ribs and cartilages. Pericardium healthy, heart much enlarged, chiefly on the right side where the auricle and ventricle are gorged with blood; valves healthy; of the lungs the greater portion on both sides solid, the extent of the affected portions being at once discernible by the difference of colour existing between them and the healthy lung, the latter being of a bright pink colour, the former of a dark purple, the surface of the solidified lung is also below that of the healthy. The atalektasis is not confined to the upper or lower lobes, but scattered

indiscriminately throughout the organs, of the left lung, at least three-fourths being solidified. On inflation with a blow-pipe, these solid portions become again filled with air, assume the natural colour, and could not be distinguished from healthy lungs.

Abdomen. Liver large, of a dark colour, the *venæ cavæ hepaticæ* gorged with blood, the mesenteric glands enlarged, the colon distended considerably with flatus. The kidneys hypertrophied.

* * * The altered movement of the ribs, spoken of in the foregoing pages, has been mentioned by others, though not in conjunction with, nor as a symptom of, *atalektasis*; namely, by my brother Mr. H. Rees, Dr. Snow, and Dr. Sibson.

